SECTION 13
WASTE SAMPLING

SECTION OBJECTIVE:

- To describe equipment and procedures that can safely be used to collect waste samples.

13.1 Introduction

Hazardous wastes are regulated by the US EPA under 40 CFR Parts 260-299. As a consequence, many of the methods that are used to manage, store, treat, and dispose hazardous wastes and potential hazardous wastes are of concern to both the regulators and the regulated community.

Samples are often required of regulated or potentially regulated materials. While it is understood that each facility and wastestream may present its own unique sampling and analytical challenges, this section will list equipment and procedures that have been used to safely and successfully sample specific waste units.

13.1.1 Safety

Sampling of waste units should be assessed for potential hazards by both the project leader and the site safety officer (SSO). It is the SSOs responsibility to enforce the site safety plan, and to ensure that procedures used during waste sampling are in accordance with Branch safety procedures and protocols found in Section 4. The procedures outlined in the Region 4 Field Health and Safety Manual (1) will be followed during sampling of all potentially hazardous wastes.

Sampling equipment contaminated during waste sampling investigations must be at a minimum cleaned with laboratory detergent and rinsed with tap water prior to returning the equipment from the field. Contaminated sampling equipment that is to be discarded must be properly disposed according to Section 5.15 and should be specified in the site-specific study plan.

13.1.2 Quality Control Procedures

In some instances, special decontamination procedures will be necessary and should be developed on a case-by-case basis according to the specific material encountered. Any cleaning procedures and equipment repairs conducted in the field which deviate from those specified in Appendix B or the study plan, should be thoroughly documented in the logbooks.

All air monitoring and field analytical/screening equipment should be checked and calibrated before being issued for field studies, as specified in Sections 16 and 17 of this SOP.

13.1.3 Collection of Auxiliary Information and Data

The collection of auxiliary information and data is particularly important when collecting waste samples. Any field analyses or field screening results should be recorded in a logbook as outlined in Section 3.5. Sketches of waste units, sampling locations, containers, tanks and ancillary equipment, markings/labels, etc., should be fully documented in logbooks. Photographs are extremely useful for recording this information and may be used during waste sampling operations. A field log of the photographs taken should be maintained as outlined in Section 3.2.2.

13.2 Waste Unit Types

Waste management units can be generally categorized into two types: open and closed. In practice, open units are larger than closed units. Open units include waste piles and surface impoundments whereas closed units include containers and tanks as well as ancillary tank equipment. Besides containers and tanks, sumps may also be considered closed units because they are designed to collect the spillage of liquid wastes and are sometimes configured as a confined space.

Although both may pose hazards, units that are open to the environment are generally less hazardous than closed units. Sampling of closed units is considered a higher hazard risk because of the potential of exposure to toxic gases and flammable/explosive atmospheres. Because closed units prevent the dilution of the wastes by environmental influences, they are more likely to contain materials that have concentrated levels of hazardous constituents. While opening closed units for sampling purposes, investigators shall use Level B personnel protective equipment, air monitoring instruments to ensure that the working environment does not contain hazardous levels of flammable/explosive gasses or toxic vapors, and follow the appropriate safety requirements stipulated in the site specific safety plan.

Buried waste materials should be located and excavated with extreme caution. Once the buried waste is uncovered, the appropriate safety and sampling procedures utilized will depend on the type of waste unit.

13.2.1 Open Units

While open units may contain many types of wastes and come in a variety of shapes and sizes, they can be generally regarded as either waste piles or surface impoundments. Definitions of these two types of open units from 40 CFR Part 260.10 are:

- Waste pile -- any non-containerized accumulation of solid, non-flowing hazardous waste that is used for treatment or storage and that is not a containment building.

- Surface impoundment -- "...a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold the accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundments are storage, settling and aeration pits, ponds, and lagoons."

One of the distinguishing features between waste piles and surface impoundments is the state of the waste. Waste piles typically contain solid or non-flowing materials whereas liquid wastes are usually contained in surface impoundments. The nature of the waste will also determine the mode of delivering the waste to the unit. Wastes are commonly pumped or gravity fed into impoundments while heavy equipment or trucks may be used to dump wastes in piles. Once the waste has been placed in an open unit, the state of the waste may be altered by environmental factors (e.g., temperature, precipitation, etc.).

Surface impoundments may contain several phases such as floating solids, liquid phase(s), and sludges. Waste piles are usually restricted to solids and semi-solids. All of the potential phases contained in a waste unit should be considered in developing the sample design to meet the study's objective.

13.2.2 Closed Units

There are a variety of designs, shapes, sizes, and functions of closed units. In addition to the challenges of the various designs and the safety requirements for sampling them, closed units are difficult to sample because they may contain liquid, solid, semi-solid/sludge, or any combination of phases. Based on the study's design, it may be necessary to obtain a cross sectional profile of the closed unit in an attempt to characterize the unit. The following are definitions of types of closed waste units described in 40 CFR Part 260.10:

- Container -- any portable device in which waste is stored, transported, treated, disposed, or otherwise handled. Examples of containers are drums, overpacks, pails, totes, and roll-offs. Portable tanks, tank trucks, and tank cars vary in size and may range from simple to extremely complex designs. Depending on the unit's design, it may be convenient to consider some of these storage units as tanks for sampling purposes even though they meet the definition of a container.

- Tank -- a stationary device, designed to contain an accumulation of waste which is constructed primarily of non-earthen materials which provide structural support.

- Ancillary tank equipment -- any device including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps that is used to distribute, meter, or control the flow of waste from its point of generation to a storage or treatment tank(s), between waste storage and treatment tanks to a point of disposal on-site, or to a point of disposal off-site.

- Sump -- any pit or reservoir that meets the definition of a tank and those troughs/trenches connected to it that serve to collect liquid wastes. (Note: some outdoor sumps may be considered open units/surface impoundments).

Although any of the closed units may not be completely sealed and may be partially open to the environment, the unit needs to be treated as a closed unit for sampling purposes until a determination can be made. Once a closed unit is opened, a review of the proposed sampling procedures and level of protection can be performed to determined if the personal protection equipment is suitable for the site conditions.

Samples collected from different waste units should not be composited into one sample container without additional analytical and/or field screening data to determine if the materials in the units are compatible and will not cause an inadvertent chemical reaction.

13.3 Equipment

Selecting appropriate equipment to sample wastes is a challenging task due the uncertainty of the physical characteristics and nature of the wastes. It may be difficult to separate, homogenize and/or containerize a waste due to its physical characteristics (viscosity, particle size, etc.). In addition, the physical characteristic of a waste may change with temperature, humidity, or pressure. Waste streams may vary depending on how and when a waste was generated, how and where it was stored/disposed, and the conditions under which it was stored/disposed. Also, the physical location of the wastes or the unit configuration may prevent the use of conventional sampling equipment.

Given the uncertainties that a waste may present, it is desirable to select sampling equipment that will facilitate the collection of samples that will meet the study's objective, and that will not unintentionally bias the sample by excluding some of the sample population that is under consideration. However, due to the nature of some waste matrices or the physical constraints of the waste unit, it may be necessary to collect samples knowing that a portion of the desired population was omitted due to limitations of the equipment. Any deviations from the study plan or difficulties encountered in the field concerning sample collection that may have an effect on the study's objective, should be documented in a log book, reviewed with the analytical data, and presented in the report.

13.3.1 Waste Sampling Equipment

Waste sampling equipment should be made of non-reactive materials that will neither add to or alter the chemical or physical properties of the material that is being sampled. Table 13.3.1 lists some conventional equipment for sampling waste units/phases and some potential limitations of the equipment.

13.3.2 Ancillary Equipment for Waste Sampling

In addition to the equipment listed in Table 13.3.1 which provides the primary device used to collect various waste samples, ancillary equipment may be required during the sampling for safety and/or analytical reasons. Some examples of these types of equipment are glass mixing pans, particle size reducers, remote drum opening devices, and spark resistant tools. See Section 13.7 for particle size reduction procedures. Any influences that these types of ancillary equipment may have on the data should be evaluated and reported as necessary.

TABLE 13.3.1
SAMPLING EQUIPMENT for VARIOUS WASTE UNITS

Equipment	Waste Units/Phases	Limitations
scoop with bracket/conduit (stainless steel)	impoundments, piles, containers, tanks/liquids, solids, sludges	Can be difficult to collect deeper phases in multiphase wastes. Depth constraints.
spoon (stainless steel)	impoundments, piles, containers/solids, sludges	Similar limitations as the scoop. Generally not effective in sampling liquids.
push tube (stainless steel)	piles, containers/cohesive solids, sludges	Should not be used to sample solids with dimensions >½ the diameter of the tube. Depth constraints.
auger (stainless steel)	impoundments, piles, containers/solids	Can be difficult to use in an impoundment or a container, or for solidified wastes.
sediment sampler (stainless steel)	impoundments, piles/ solids, sludges	Should not be used to sample solids with dimensions >½ the diameter of the tube.
ponar dredge (stainless steel)	impoundments/solids, sludges	Must have means to position equipment to desired sampling location. Difficult to decon.
COLIWASA or drum thief (glass)	impoundments, containers, tanks/liquids	Not for containers >4 feet deep. Not good with viscous wastes.
Mucksucker™, Dipstick™ (Teflon®)	impoundments, containers, tanks/liquids, sludges	Not recommended for tanks >11 feet deep.
bacon bomb (stainless steel)	impoundments, tanks/ liquids	Not good with viscous wastes.
bailer (Teflon®, stainless steel)	impoundments, tanks/ liquids	Only if waste is homogeneous. Not good with viscous wastes.
peristaltic pump with vacuum jug assembly (Teflon®)	impoundments, tanks/ liquids	Cannot be used in flammable atmospheres. Not good with viscous wastes.
back-hoe bucket	piles/solids, sludges	May be difficult to access desired sampling location. Difficult to decon. Can lose volatiles.
split-spoon	piles/solids	Requires drill rig.
roto-hammer	piles, containers/solids	Physically breaks up sample. May release volatiles. Not for flammable atmospheres.

13.4 Waste Sampling Procedures

13.4.1 Waste Piles

Waste piles vary in size, shape, composition, and compactness, and may vary in distribution of hazardous constituents and characteristics (strata). These variables will affect safety and access considerations. The number of samples, the type of sample(s), and the sample location(s) should be based on the study's objectives. Commonly used equipment to collect samples from waste piles are listed in Table 13.3.1. All equipment should be compatible with the waste and should have been cleaned to prevent any cross contamination of the sample.

13.4.2 Surface Impoundments

Surface impoundments vary in size, shape, and waste content, and may vary in distribution of hazardous constituents and characteristics (strata). The number of samples, the type of sample(s), and the sample location(s) should be based on the study's objectives. Commonly used equipment to collect samples from surface impoundments are listed in Table 13.3.1. All equipment should be compatible with the waste and should have been cleaned to prevent any cross contamination of the sample.

Because of the potential danger of sampling waste units suspected of containing elevated levels of hazardous constituents, personnel should never attempt to sample surface impoundments used to manage potentially hazardous wastes from a boat. All sampling should be conducted from the banks or piers of surface impoundments. Any exception must be approved by the appropriate site safety officer and/or the Occupational Health and Safety Designee (OHSD).

13.4.3 Drums

The most frequent type of containers sampled for hazardous constituents or characteristics by field investigators are drums. Caution should be exercised by the field investigators when sampling drums because of the potential presence of explosive/flammable gases and/or toxic vapors. Therefore, the following procedures should be used when collecting samples from drums of unknown material:

1. Visually inspect all drums that are being considered for sampling for the following:
    - pressurization (bulging/dimples);
    - crystals formed around the drum opening;
    - leaks, holes, stains;
    - labels, markings;
    - composition and type (steel/poly and open/bung);
    - condition, age, rust; and
    - sampling accessibility.

    Drums showing evidence of pressurization and crystals should be furthered assessed to determine if remote drum opening is needed. If drums cannot be accessed for sampling, heavy equipment is necessary to stage drums for the sampling activities. Adequate time should be allowed for the drum contents to stabilize after a drum is handled.

2. Identify each drum that will be opened (e.g., paint sticks, spray paint, cones, etc).

LEVEL "B" PROTECTION IS REQUIRED FOR THE FOLLOWING PROCEDURES.

3. Before opening, ground each metal drum that is not in direct contact with the earth using grounding wires, alligator clips, and a grounding rod or metal structure. If a metal drum is in an overpack drum, the metal drum should be grounded.

4. Touch the drum opening equipment to the bung or lid and allow an electrical conductive path to form. Slowly remove the bung or drum ring and/or lid with spark resistant tools (brass/beryllium).

5. Screen drums for explosive gases and toxic vapor with air monitoring instruments as bung or drum lid is removed. Depending on site conditions screen for one or more of the following:

   - radioactivity;
   - cyanide fumes;
   - halogen vapors;
   - pH; and/or
   - flash point (requires small volume of sample for testing).

   Note the state, quantity, phases, and color of the drum contents. Record all relevant results, observations, and information in a logbook or on a Drum Data Form. Figure 13-1 is an example of a Drum Data Form. Review the screening results with any pre-existing data to determine which drums will be sampled.

6. Select the appropriate sampling equipment based on the state of the material and the type of container. Sampling equipment should be made of non-reactive materials that will neither add or alter the chemical or physical properties of the material that is to be sampled.

7. Place oil wipe, sampling equipment, and sample containers near drum(s) to be sampled.

AIR MONITORING FOR TOXIC VAPORS AND EXPLOSIVE GASES AND OXYGEN DEFICIENT ATMOSPHERES SHOULD BE CONDUCTED DURING DRUM SAMPLING.

   Liquids -- Slowly lower the COLIWASA or drum thief to the bottom of the container. Close the COLIWASA with the inner rod or create a vacuum with the sampler's gloved thumb on the end of the thief and slowly remove the sampling device from the drum. Release the sample from the device into the sample container(s) splitting each COLIWASA volume among the containers, if possible. Repeat the procedure until a sufficient sample volume is obtained.

   Solids/Semi-Solids -- Use a push tube, bucket auger, or screw auger or if conditions permit a pneumatic hammer/drill to obtain the sample. Carefully use a clean stainless steel spoon to place the sample into container(s) for analyses.

8. Close the drums when sampling is complete. Segregate contaminated sampling equipment and investigative derived wastes (IDW) containing incompatible materials as determined by the drum screening procedure (Step #5). At a minimum, contaminated equipment should be cleaned with laboratory detergent and rinsed with tap water prior to returning it from the field. IDW should be managed according to Section 5.15.

FIGURE 13-1
DRUM DATA FORM

Date _____ Page _____

SAMPLE COLLECTED: Y / N

4444444444444444444444444444444444444444444

PROJECT NO._____ SITE NAME: _____

CITY _____ STATE: _____

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EPA DRUM ID# _____ OTHER DRUM ID# _____

DRUM OBSERVATIONS:

1) OVERPACK: Y / N METAL / PLASTIC / OTHER _____
SIZE: 85 / 55 / ___

2) DRUM: METAL / PLASTIC / OTHER _____
SIZE: 85 / 55 / ____
CONDITION: GOOD / FAIR / POOR
MARKINGS/LABELS: _____
_____
_____
_____
_____

3) DRUM OPENING TEAM: _____

4) ESTIMATED VOLUME: FULL / ¾ / ½ / ¼ / EMPTY

5) PHYSICAL APPEARANCE OF DRUM CONTENTS:

COLOR: _____ VISCOSITY: LOW / MED / HIGH
PHASED: Y / N ; DESCRIPTION:_____
OTHER: _____

6) AIR MONITORING RESULTS:

PID _____ppm EXPLOS ___%O_2____%LEL
FID _____ppm HALOGEN Yes No
CN _____ppm pH _____
RAD _____Mrem _____

7) FLASH POINT SAMPLE COLLECTED: YES / NO
FLASH RESULTS AT 140°F: YES / NO
HOT WIRE TEST FOR HALOGEN: POS / NEG

8) SAMPLE COLLECTED: YES / NO TIME: _____
COLLECTOR(S):_____

13.4.4 Tanks

Sampling tanks is considered hazardous due to the potential for them to contain large volumes of hazardous materials and therefore, appropriate safety protocols must be followed. Unlike drums, tanks may be compartmentalize or have complex designs. Preliminary information about the tank's contents and configuration should be reviewed prior to the sampling operation to ensure the safety of sampling personnel and that the study's objectives can be achieved.

In addition to having discharge valves near the bottom of tanks and bulk storage units, most tanks have hatches at the top. It is desirable to collect samples from the top hatch because of the potential for the tank's contents to be stratified. Additionally, when sampling from the discharge valve, there is a possibility of a stuck or broken valve which could cause an uncontrolled release. Investigators should <u>not</u> utilize valves on tanks or bulk storage devices unless they are operated by the owner or operator of the facility, or a containment plan is in place should the valve stick or break. If the investigator must sample from a tank discharge valve, the valving arrangement of the particular tank must be clearly understood to insure that the compartment(s) of interest is sampled.

Because of the many different types of designs and materials that may be encountered, only general sampling procedures that outline sampling a tank from the top hatch are listed below:

1. All relevant information concerning the tank such as the type of tank, the tank capacity, markings, condition, and suspected contents should be documented in a logbook.

2. The samplers should inspect the ladder, stairs, and catwalk that will be used to access the top hatch to ensure that they will support the samplers and their equipment.

LEVEL "B" PROTECTION IS REQUIRED FOR THE FOLLOWING PROCEDURES.

3. Before opening, ground each metal tank using grounding wires, alligator clips, and a grounding rod or metal structure.

4. Any vents or pressure release valves should be slowly opened to allow the unit to vent to atmospheric pressure. Air monitoring for explosive/flammable gases and toxic vapors should be conducted during the venting with the results recorded in a log book. If dangerous concentrations of gases evolve from the vent or the pressure is too great, leave the area immediately.

5. Touch tank opening equipment to the bolts in the hatch lid and allow electrical conductive path to form. Slowly remove bolts and/or hatch with spark resistant tools (brass/beryllium). If a pressure build up is encountered or detected, cease opening activities and leave the area.

6. Screen tanks for explosive/flammable gases and toxic vapors with air monitoring instruments. Depending on the study objectives and site conditions, conduct characteristic screening (e.g., pH, halogen, etc.) as desired. Collect a small volume of sample for flash point testing, if warranted. Note the state, quantity, number of phases, and color of the tank contents. Record all relevant results, observations, and information in a logbook. Compare the screening results with any pre-existing data to determine if the tank should be sampled.

7. Select the appropriate sampling equipment based on the state of the material and the type of tank. Sampling equipment should be constructed of non-reactive materials that will neither add to or alter the chemical or physical properties of the material that is to be sampled.

8. Place oil wipe, sampling equipment, and sample containers near tanks(s) to be sampled.

AIR MONITORING FOR TOXIC VAPORS, EXPLOSIVE GASES AND OXYGEN DEFICIENT ATMOSPHERES SHOULD BE CONTINUOUS DURING TANK SAMPLING.

Liquids -- Slowly lower the bailer, bacon bomb, Dipstick™, COLIWASA, or Teflon® tubing to the desired sampling depth. (NOTE: In work areas where explosive/flammable atmospheres could occur, peristaltic pumps powered by 12 V. batteries should not be used.) Close the sampling device or create a vacuum and slowly remove the sampling device from the tank. Release the sample from the device into the sample container(s). Repeat the procedure until a sufficient sample volume is obtained.

Solids/Semi-Solids - Use a push tube, bucket auger, screw auger, Mucksucker™, or if conditions permit a pneumatic hammer/drill to obtain the sample. Carefully extrude the sample from the sampling device or use a clean stainless steel spoon to place the sample into containers for analyses.

9. Close the tank when sampling is complete. Segregate contaminated sampling equipment and investigative derived wastes (IDW) containing incompatible materials as determined by the drum screening procedure (Step #6). At a minimum, contaminated equipment should be cleaned with laboratory detergent and rinsed with tap water prior to returning it from the field. IDW should be managed according to Section 5.15.

13.5 Miscellaneous Contaminated Materials

Sampling may be required of materials or equipment (e.g., documents, building materials, equipment, etc.) to determine whether or not various surfaces are contaminated by hazardous constituents, or to evaluate the effectiveness of decontamination procedures.

Wipe or swab samples may be taken on non-absorbent surfaces such as metal, glass, plastic, etc. The wipe materials must be compatible with the solvent used and the analyses to be performed, and should not come apart during use. The wipes are saturated with either methylene chloride, hexane, or analyte free water depending on the parameters to be analyzed (consult with laboratory performing the analyses). Wipe samples should not be collected for volatile organic compounds analysis. Sampling personnel should be aware of hazards associated with the selected solvent and should take appropriate precautions to prevent any skin contact or inhalation of these solvents. All surfaces and areas selected for sampling should be based on the study's objectives. Typically, 10 cm by 10 cm templates are prepared from aluminum foil which are secured to the surface of interest. The prepared (saturated with solvent) wipe(s) is removed from its container with tongs or gloves, and used to wipe the entire area with firm strokes using only one side of the wipe. The wipe is then placed into the sample container. This procedure is repeated until the area is free of visible contamination or no more wipes remain. Care should be taken to keep the sample container tightly sealed to prevent evaporation of the solvent. Samplers must also take care to not touch the used side of the wipe. All requests for support from the Region 4 laboratory for wipe preparations and wipe analyses should be made well in advance of the scheduled sampling event. (Note: if gloves are used to collect the wipe samples, control samples should be collected to determine if the gloves could potentially contribute constituents to the parameters of interest.)

For items with porous surfaces such as documents (usually business records), insulation, wood, etc., actual samples of the materials are required. It is therefore important, that during the collection and/or analyses of the sample that evidentiary material is not destroyed. Use scissors or other particle reduction device that have been cleaned as specified in Appendix B to cut/shred the sample. Mix in a glass pan as specified in Section 5.13.8. The shredded, homogenized material is then placed in sample containers.

13.6 Waste Sample Handling Procedures

Waste samples should not be preserved because of the potential for an inadvertent chemical reaction of the sample with the preservative. After the samples have been collected and containerized, the outside of the containers should be cleaned with water, paper towels, and/or oil wipes to remove any spilled sample from the exterior of the container. Sample containers should be identified with tags and sealed for custody purposes as specified in Section 3 as soon as possible. After the sample container has been tagged and sealed, each container should placed in a separate plastic bag and secured with electrical tape before being placed in a cooler. Waste samples that are suspected of being acutely toxic or extremely hazardous should be placed in paint cans with absorbent materials prior to being placed in a cooler. Waste samples should not be placed on ice because the potential of a sample being water reactive.

13.7 Particle Size Reduction

Particle size reduction of waste samples is periodically required in order to complete an analytical scan or the Toxicity Characteristic Leaching Procedure (TCLP) test. Samples that may require particle size reduction include slags, bricks, glass/mirror cullet, wire, etc. Method 1311 (TCLP) states "Particle size reduction is required, unless the solid has a surface area per gram of material equal to or greater than 3.1 cm^2, or is smaller than 1 cm in its narrowest dimension (i.e., capable of passing through a 9.5 mm (0.375 inch) standard sieve). If the surface area is smaller or the particle size larger than described above, prepare the solid portion of the waste for extraction by crushing, cutting, or grinding the waste to a surface area or particle size as described above" (55 FR 26990). The method also states that the surface criteria are meant for filamentous (paper, cloth, etc.) waste materials, and that "Actual measurement of the surface area is not required, nor is it recommended". Also, the loss of volatile organic compounds could be significant during particle size reduction.

Waste samples that require particle size reduction are often too large for standard sample containers. If this is the case, the sample should be secured in a clean plastic bag and processed using normal chain-of-custody procedures (Section 3). Note that the tags that will be required for the various containers should be prepared in the field and either inserted into or attached to the sample bag. The bag should then be sealed with a custody seal.

Because of the difficulty in conducting particle size reduction, it is typically completed at the Field Equipment Center (FEC). The following procedure may be used for crushing and/or grinding a solid sample:

1. Remove the entire sample, including any fines that are contained in the plastic bag and place them on the standard cleaned stainless steel pan.

2. Using a clean hammer, carefully crush or grind the solid material (safety glasses are required), attempting to minimize the loss of any material from the pan. Some materials may require vigorous striking by the hammer, followed by crushing or grinding. The material may be subject to crushing/grinding rather than striking.

3. Continue crushing/grinding the solid material until the sample size approximates 0.375 inch. Attempt to minimize the creation of fines that are significantly smaller than 0.375 inch in diameter.

4. Pass the material through a clean 0.375-inch sieve into a glass pan.

5. Continue this process until sufficient sample is obtained. Thoroughly mix the sample as described in Section 5.13.8 of this SOP. Transfer the contents of the glass pan into the appropriate containers.

6. Attach the previously prepared tags and submit for analyses.

13.8 REFERENCES

1. Field Health and Safety Manual, United States Environmental Protection Agency, Region IV, 1990 Edition.

2. Title 40 Code of Federal Regulations, Parts 260-299, US-EPA, July 1, 1995.

3. Standard Guide for Sampling Heterogeneous Wastes (Draft), ASTM Standard, D34.01.12.

4. Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), Third Edition, Final (Promulgated) Update II, US-EPA, Office of Solid Waste and Emergency Response, Washington, D.C., September, 1994.

5. Compendium of ERT Waste Sampling Procedures, US-EPA, EPA/540/P-91/008 (OSWER Directive 9360.4-07), January 1991.

6. Characterization of Hazardous Waste Sites - A Methods Manual: Volume 1 -Site Investigations, US-EPA, EMSL, Las Vegas, EPA-600/4-84-075, April 1985.

7. Characterization of Hazardous Waste Sites - A Methods Manual: Volume II -Available Sampling Methods, 2nd Edition, US-EPA, EMSL, Las Vegas, EPA 600/4-84-076, December 1984.